
Rediscovered after 200 Years, *Moraea ovata* Thunberg Is a Rare *Ferraria* (Iridaceae: Iridoideae) from Namaqualand, South Africa

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ABSTRACT. Rediscovery in the late 1990s of the mysterious *Moraea ovata* Thunberg, described in 1800 and first collected in 1793 in early fruit, shows that the species belongs to the related genus *Ferraria*. Flowers, only found in June 2001, show that it has parallel anther locules and a spindle-shaped ovary without a sterile beak, features consistent with section *Ferraria* of the genus. The new combination *F. ovata* is provided for the species, which we speculate is most closely related to *F. densepunctulata*, native to the west coast of Western Cape Province, South Africa. The range of *F. ovata* is restricted to low to middle elevations in central Namaqualand in Northern Cape Province, South Africa.

Key words: *Ferraria*, Iridaceae, *Moraea*, phytogeography, southern Africa.

The southern African *Moraea ovata* Thunberg has been a puzzling plant to botanists ever since it was described just 200 years ago. It was named by Carl Peter Thunberg in 1800 in his preliminary account of the Cape flora, *Prodromus plantarum capensium*. This work included plants from all of southern Africa, but effectively only dealt with the winter-rainfall belt of the subcontinent, which extends north and west of Cape Town along the coast and near interior. Summer-rainfall southern Africa had barely been explored botanically at the time. *Moraea ovata* was only known to Thunberg from three fruiting specimens, all of which lacked a corm, the underground storage organ of most Iridaceae, and often a feature of taxonomic importance. In fact, the reason the species was placed in *Moraea* was most likely because it clearly had an inferior ovary. Thunberg's account is succinct, but accurately describes the short stem, round in section, bearing broadly ovate leaves. Later, in his *Flora capensis* published in 1820, Thunberg mentioned that he received his specimens from the

English plant collector Francis Masson, and that they grew "in Namaquas juxta koks fontein" (in Namaqualand near Koksfontein), the locality confirmed by the annotation on the type sheet of *M. ovata*, "Cocksfonteyn."

So confusing was *Moraea ovata* that the English botanist J. G. Baker, in his account of the Iridaceae in *Flora capensis* (1897), treated the species as a synonym of the western southern African *Lapeirousia pyramidalis* (Lamarck) Goldblatt (which Baker called *L. fissifolia* (Jacquin) Ker Gawler). The assignment was made because *L. pyramidalis* has an inflorescence with unusually broad bracts that resemble in a crude way the leaves of *M. ovata*. The leaves of the latter are, however, true leaves, i.e., they do not subtend a flower nor are they associated with a smaller inner bract as they would be in *Lapeirousia* if they were floral bracts surrounding a flower. In 1928 a second English botanist, N. E. Brown (1928), critically examined the specimens in the Thunberg Herbarium housed at Uppsala, Sweden, and concluded that the specimens were not a *Lapeirousia*, but he made no further comment. In a revision of the Cape species of *Lapeirousia*, Goldblatt (1972) was not so certain, and *M. ovata* was provisionally regarded as a somewhat divergent form of *L. pyramidalis*.

From the sparse literature relating to Masson's travels during his second visit to the Cape (1786–1795), we assume it was on his 1793 visit to Namaqualand that Masson collected these plants (Gunn & Codd, 1981). It has been established that Masson traveled as far as the Kamiesberg in that year, since he collected certain species that only occur there (Forbes, 1965), but his exact itinerary is not known. There is no Koksfontein recorded in the place names in the Kamiesberg, but Kookfontein is the name given to the original farm on which the present-day settlement of Soebatsfontein lies.

Could Masson have passed through the area that lies to the west of the Kamiesberg on his trip to or from the mountains? This seemed likely, for in 1995 the conservation biologist Anelise le Roux collected a sterile specimen that exactly matched Masson's type collection on the farm Doornfontein, which lies on the eastern boundary of Kookfontein. We returned there in 1997 but failed to locate more plants.

In 1999, during a multidisciplinary expedition to Namaqualand, the biologists Nick Helme and Philip Desmet discovered a handful of plants that closely matched Masson's specimens in the Knersvlakte south of Kliprand on the farm Steenbokskraal (not at all close to Soebatsfontein). Although the plants were in bud, they did not look as if they would flower, so three specimens were carefully dug up, later to be replanted. These plants differed slightly from those collected previously by Masson and le Roux in having short, narrow basal leaves that were unifacial in the upper half as are those of *Ferraria*, a genus of 10 species of semi-arid habitats in southern and south tropical Africa (de Vos, 1979). The corms were also exactly like those of a *Ferraria* in their compressed, discoid shape, multiple internodes, and lack of long-lived, fibrous tunics. The habitat was not especially distinctive, for plants were found growing on a gentle, sandy slope in veld dominated by dwarf succulents. In August 2000 we discovered yet another population of the species, again in sterile condition, west of Kliprand.

In early June 2001, this botanical mystery was finally solved when the population that we found the previous year was revisited. Several plants in full bloom were found and the identity of *Moraea ovata* could finally be established. The flowers, like the corm, match exactly those of *Ferraria* (de Vos, 1979), having subequal, clawed, lanceolate tepals, with crisped margins. Like other species of *Ferraria*, the filaments are united in a slender column for most of their length, and the style divides at the apex of the filament column to form three flattened, somewhat petaloid style branches that are deeply forked, with an abaxial stigmatic surface, and with fringed distal margins that extend over the stigma lobes.

Ferraria ovata (Thunberg) Goldblatt & J. C. Manning, comb. nov. Basionym: *Moraea ovata* Thunberg, Prod. pl. cap. 186. 1800. TYPE: South Africa. Northern Cape (Namaqualand near Koksfontein), without date, *Masson in herb. Thunberg 1225* (holotype, UPS). Figure 1.

Plants 4–20 cm high, mostly unbranched. Corm

discoid, ca. 2 cm diam., the old corms persisting beneath the current one. Stem erect, terete. Basal leaves linear, channeled below, to 4.5 cm long, the upper half unifacial, ca. 2 mm wide, upper leaves amplexicaul, broadly ovate and concave with narrow reddish membranous margins, 1.5–1.8 cm long and up to 1.5 cm wide, with a short, unifacial tip; leaves of immature plants unifacial, linear, up to 15 cm long, ca. 2 mm wide. Inflorescence a rhipidium of 1 or 2 flowers, spathes green, leathery, ovate with narrow reddish membranous margins, the outer 10–12 mm long, the inner 12–15 mm long. Flowers actinomorphic, lightly acrid-scented, lasting 1 day, cream streaked with maroon, the tepal limbs spreading or lightly reflexed, yellow marked with a few brown spots and with undulate and minutely crisped chocolate brown margins; tepals free, lanceolate, subequal, the inner slightly smaller than the outer, the claws ascending, forming a cup ca. 7 mm deep and ca. 8 mm diam. at the rim, the inner 15–18 × 5–6 mm with claws 6–7 mm long, the outer 15–20 × 7–9 mm with claws 6–7 mm long; nectaries bipartite with two concave hollows, 2 × 2 mm, situated between the lower third and middle of the tepal claws. Filaments united in a smooth column, 7–8 mm long; anthers diverging, appressed to the style branches, 2 mm long, the anther lobes parallel. Ovary included in the spathes, ovoid, 6 mm long; style dividing at the apex of the filament column, the branches diverging, deeply divided, terminating in feathery crests, the stigma lobes abaxial, below the crests. Mature capsules and seeds unknown.

Flowering time. June and possibly July.

Distribution. *Ferraria ovata* is apparently restricted to south-central Namaqualand, where it occurs on stony, granite-derived soil at middle elevations. Despite the few collections known, it may be more common than the record indicates. Plants are inconspicuous except in flower, and flowering occurs early in the season when little plant exploration is undertaken to Namaqualand, where the main flowering occurs in August and September.

Relationships. In her account of *Ferraria*, de Vos (1979) recognized two main clusters of species plus the monotypic section *Glutinosae* for the south tropical African *F. glutinosa* (Baker) Rendle. Sections *Ferraria* and *Glutinosae* comprise *Ferraria* species with the apparently plesiomorphic feature of parallel anther lobes. While section *Glutinosae* has flowers with a plesiomorphic ovoid-truncate ovary and capsule, species of section *Ferraria* have an elongate, spindle-shaped ovary lacking a sterile beak (rostrum) except in *F. schaeferi*. Species of

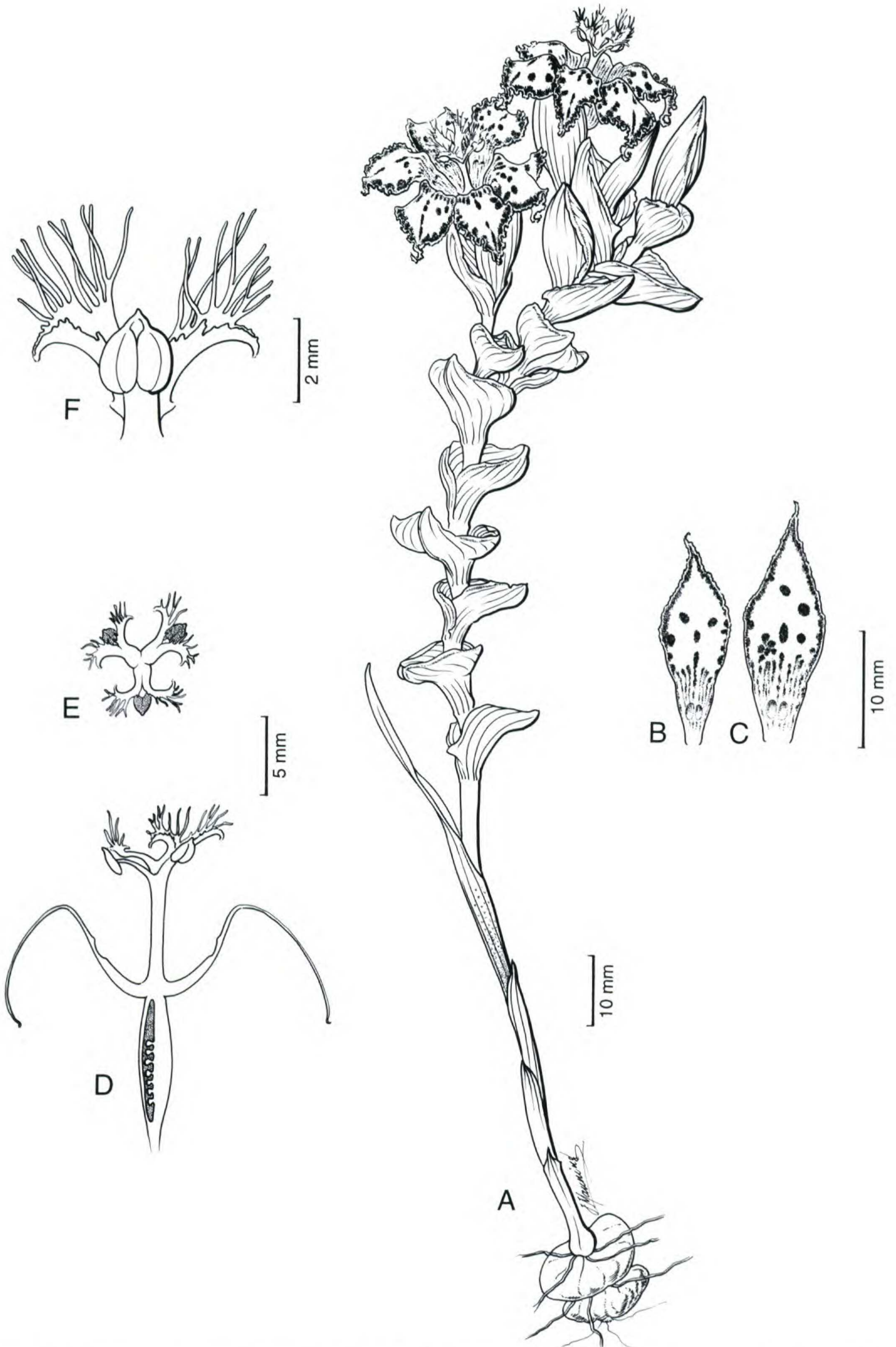


Figure 1. *Ferraria ovata* (Thunberg) Goldblatt & J. C. Manning. —A. Entire plant with corm. —B. Inner tepal. —C. Outer tepal. —D. Diagrammatic section of flower showing spindle-shaped ovary, filament column, and orientation of the style branches and anthers. —E. Top view of style branches showing divided style branches with fringed margins and position of the anthers (shaded). —F. Detail of the tip of one style branch and anther with parallel lobes. Drawn by J. C. Manning from *Manning 2350* (NBG).

Ferraria sect. *Macroscyphae* have an apomorphic rostrate ovary with a sterile, somewhat tubular beak at least 8 mm long, and anther lobes that either diverge from the apex or are initially parallel but later diverge toward the base (only *F. ferrariola* (Jacquin) Willdenow, which thus seems somewhat ambiguously placed in the section).

Ferraria ovata is clearly a member of section *Ferraria* and resembles *F. densepunctulata* M. P. de Vos of the Cape west coast in several aspects, particularly its marked heterophylly, with the blades of the lower leaves linear and up to 5 mm wide, small stature, and especially significantly in the position of the nectaries. In all other species of *Ferraria* the nectaries are situated at the base of the tepals, but in *F. densepunctulata* and *F. ovata* they are situated near the middle of the tepal claws. The two species resemble one another also in their early flowering, in May and June. They differ most significantly in the shape of the cauline leaves and in the color and longevity of the flowers. In *F. densepunctulata* the cauline leaves are lanceolate, unlike

the ovate, cucullate cauline leaves of *F. ovata*, and the pale gray or greenish flowers are finely marked with maroon or purple spots, bear conspicuous yellow-green nectaries, and remain open for two days, unlike the yellow, boldly marked flowers of *F. ovata* that last just one day and have inconspicuous cream nectaries streaked with maroon.

Species of section *Ferraria* are confined to the west coast and near interior of South Africa and southwestern Namibia, an area that lies entirely within the southern African winter-rainfall zone.

Biology. The slightly fetid-smelling, dull-colored, brown-speckled flowers are typical of *Ferraria*, most species of which are visited by muscid and calliphorid flies (unpublished data), and which we assume are fly-pollinated, as did Vogel (1954). *Ferraria ovata* may likewise be considered to share this pollination strategy, for we observed several muscid flies crawling on the flowers and carrying loads of the orange-colored pollen of the species. Flies were not captured for identification. Flies visit the flowers to feed on nectar produced from the nectaries located on the tepals.

A REVISED KEY TO SECTION *FERRARIA*

DISCUSSION

We include *Ferrariola ferrariola* in the key below, for although it was included in section *Macroscyphae* by de Vos, its sectional position is ambiguous. It shares with section *Ferraria* the nearly parallel anther lobes (they diverge from the base with age), but it has the rostrate ovary characteristic of section *Macroscyphae*, also, however, present in *F. schaeferi* Dinter of section *Ferraria*. In particular, *F. ferrariola* shares the heterophyllous condition with *F. densepunctulata* and *F. ovata*. Whatever its correct sectional position, it seems helpful to include *F. ferrariola* in the key to section *Ferraria*.

- 1a. Stem slender with internodes partly exposed; lower leaves linear to falcate, with blades usually less than 5 mm wide; nectaries situated at the base or near the middle of the tepals.
 - 2a. Basal leaf sheaths conspicuously reddish or red-spotted; nectaries situated at the base of the tepal claws; ovary rostrate; stigmas large and flap-like, partially obscuring the anthers *F. ferrariola*
 - 2b. Basal leaf sheaths at most faintly flushed reddish; nectaries situated near the middle of the tepal claws; ovary rostrate; stigmas minute, at the tip of curving, horn-like branches.
 - 3a. Cauline leaves ovate-cucullate; flowers yellow with brown margins and a few conspicuous spots; nectaries cream streaked maroon *F. ovata*
 - 3b. Cauline leaves lanceolate-attenuate; flowers gray or greenish with minute brown or maroon speckling; nectaries yellowish green *F. densepunctulata*
- 1b. Stem stout, mostly covered by leaf bases; leaves sword-shaped to falcate, with blades more than 5 mm wide; nectaries situated at the base of the tepals.
 - 4a. Ovary with a short tapering rostrum ca. 8 mm long; tepals 22–25(–30) mm long, yellow with dark brown margins and blotches, often coalescing in the outer quarter; flowers sweetly scented *F. schaeferi*
 - 4b. Ovary without a tapering rostrum; tepals 25–35 mm long, flowers variously colored, usually dark maroon or purple with paler margins or cream to pale yellow and variously striped and blotched; flowers with an unpleasant fetid scent.
 - 5a. Leaves with a thickened zone in the middle and a strong pseudomidrib, 2-ranked . . . *F. crispa* Burman
 - 5b. Leaves with numerous veins of equal size and without a pseudomidrib, often spirally 2-ranked *F. foliosa* G. J. Lewis

Additional specimens (cited according to the geographical quarter-degree square system for indicating latitude and longitude in use in southern Africa). SOUTH AFRICA. **Northern Cape:** 30.17 (Hondeklipbaai) Farm Doornfontein, Steenkamp Kraal (BA), 2 Sep. 1995 (sterile), *Le Roux* 4658 (JONK). **Western Cape:** 30.18 (Kamiesberg) Farm Gannabos on road from Bitterfontein to

Kliprand (CD), 10 Aug. 2000 (sterile), *Goldblatt & Manning* 11373 (MO, NBG), 6 June 2001, *Manning* 2350 (NBG); Knersvlakte, Farm Steenbokskraal, 20 Aug. 1999, *National Geographic-IPC Expedition* 115 (NBG).

Acknowledgments. Support for our study by

grants 6704-00 and 7103-01 from the National Geographic Society is gratefully recognized. We thank Anelise Le Roux and Philip Desmid for their assistance in relocating the elusive *Ferraria ovata*.

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